**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

**Patent Application**

| | |
|---|---|
| Applicant(s): | Lawrence Allen Rigge |
| Case: | 7 |
| Serial No.. | 10/672,656 |
| Filing Date: | September 26, 2003 |
| Group: | 2617 |
| Examiner: | Kiet M Doan |
| Title: | Method and System for Wireless Communication Within an Integrated Circuit Under Evaluation |

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DECLARATION UNDER 37 C.F.R. §1.131

I, the undersigned, hereby declare and state as follows:

1. I am the named sole inventor of the invention that is the subject of the above-referenced U.S. patent application. I have assigned my respective interests in the patent application to Agere Systems Inc. ("Agere").

2. The invention was conceived on or before April 23, 2003 and all inventive activity described herein took place in the United States of America.

3. Prior to April 4, 2003, I prepared an Invention Submission document as required by Agere. On or about April 4, 2003, the Invention Submission document, subsequently assigned Submission No 124672, entitled "Wireless IC Debugging and Monitoring," was submitted to a former Agere in-house patent attorney, Mark Kurisko. The date that the Invention Submission document was Received by Agere IP Law is noted in the upper right hand portion of the

document as April 4, 2003. A copy of the Invention Submission document dated April 4, 2003is attached hereto as Exhibit 1

4. The Invention Submission document describes an invention falling within one or more of the claims of the present application. For example, Applicants note that pending independent claims 1, 13 and 25 are supported by the figure on page 3 of the Submission. Exhibit 1 provides evidence that the aspects of the invention claimed in claims 1, 13 and 25 (as well as additional dependent claims) were conceived on or before April 4, 2003.

5. On May 19, 2003, the above-referenced patent submission was sent to outside counsel, Ryan, Mason & Lewis, LLP, for preparation of a patent application. A copy of the cover letter is attached hereto as Exhibit 2.

6. On July 16, 2003 at 10 am, Mr. Kevin Mason and I discussed the above-referenced application. A copy of a calendar entry of Mr. Mason documenting this meeting is attached hereto as Exhibit 3.

7. On or about July 22 and 23, 2003, I provided additional disclosure materials to Mr. Mason. A copy of an email from Mr. Mason acknowledging receipt of the additional documents is included in Exhibit 4

8 Mr. Mason provided an initial draft of the patent application on August 18, 2003. See, Exhibit 4.

9. I provided my comments to Mr. Mason on the initial draft of the patent application on August 26, 2003. See, Exhibit 5.

10. The application was subsequently reviewed internally by former in-house Managing Attorney, Mark Kurisko.

11. Following approval by Mr. Kurisko, a final draft was sent by Mr. Mason to me on September 23, 2003. See, Exhibit 6.

12. As noted above, the present patent application was filed by Mr. Mason on September 26, 2003.

13. All statements made herein of my own knowledge are true, and all statements made on information and belief are believed to be true.

14. I understand that willful false statements and the like are punishable by fine or imprisonment, or both, under 18 U.S.C. §1001, and may jeopardize the validity of the application or any patent issuing thereon.

Date: 10/31/2008

Lawrence Allen Rigge

Exhibit 1

III

IC Design

# AGERE SYSTEMS INVENTION SUBMISSION

**This invention submission is being provided to an attorney in order to determine how to protect intellectual property and to facilitate efforts to acquire appropriate protection. Distribution of this invention submission shall be limited to attorneys and persons acting on behalf of Agere to facilitate making such determinations.**

| Name(s) of Submitters | Telephone No: | Loc/Room | SBU/Org. Title: | HR ID: | E-Mail Address |
|---|---|---|---|---|---|
| Lawrence Rigge | 610 712-3327 | LVCC 10C-148 | NED/CTO | 5726626 | rigge@agere.com |
| | | | | | |
| | | | | | |

**IP LAW USE**
**Submission No:** 12472
**Date Received:** 4/4/03
**Attorney:** Mark Kwisz

**TITLE:** Wireless IC Debugging and Monitoring

**Important Notes: (1) Keep in mind that your submission should be written so it can be understood in 5 to 10 minutes by a generalist. Avoid the use of undefined acronyms and jargon. Keep the language simple. (2) Have any of the above submitter(s) discussed this invention with, or provided an invention submission disclosing this invention to, an attorney other than the recipient of this invention submission? ____YES ____NO**

1. **Describe the problem your invention solves:**

   For debugging, test, and monitoring, this idea allows large amounts of data (>100 MBPS) in the device or system to be transferred with very little overhead and without disrupting normal system operation. It provides unique capability to access the internal operation of highly integrated SOC devices.

2. **Based on information of which you are already aware, describe:**
   **(i) previous attempts to solve the problem your invention solves:**

   Traditional HW or HW/SW debugging systems use electrical connections to the device or system being tested to transfer data.

   **(ii) the disadvantages of the previous attempts:**

   There are several disadvantages of the current approach:
   - Usually, few pins can be devoted to testing so the amount of system or internal chip data that can be monitored is limited, generally to a few MBPS, which is insufficient for debugging processors, SOC devices, broadband wireless devices, etc.
   - In small form factor products such a cellular phones or wireless LAN cards it is not practical to have many probe wires.
   - Long electrical connections to logic analyzers or test equipment can be difficult to set up, and often require substantial skill and time.

3. **Summarize (30 words or less) the new feature(s) of your invention that solves the problem:**

Use ultra-wideband (UWB) wireless techniques to transfer large amounts of data to/from devices. Very simple, small die area transceivers can be used since the signal only needs to propagate a few centimeters to the test equipment probe. A single pin I/O is all that is necessary for the RF signal, and on larger devices it may be practical to use an on-chip antenna. Below is an example UWB TX and RX block diagram

*** Provide the information requested in this box on each page of the submission, as well as drawings, sketches, photographs, etc. ***

**Submitter(s) signature(s) and date:**

_____ _____ **date**

_____ _____ **date**

_____ _____

**This invention submission has been read and understood by the following two witnesses:**

_____ _____ **date**

_____ _____ **date**

**ATTORNEY-CLIENT PRIVILEGED DOCUMENT**

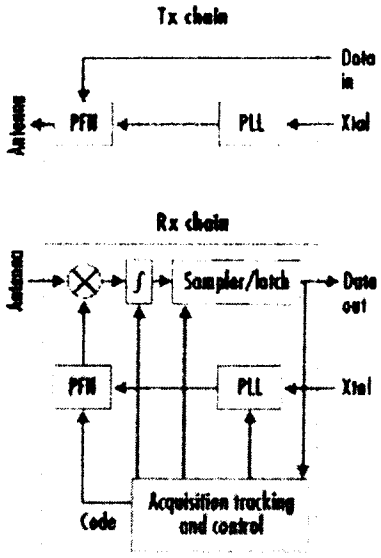



**FIGURE 4:** In a UWB system, the antenna is driven directly by the baseband and no PA is needed.

The PLL can be shared, so the total area can be quite small. Depending on the system, an even simpler receiver can be used so it is estimated that the UWB transceiver could be implemented in 1 $mm^2$ or less in 0.13μm technology.

4. **Succinctly describe your invention, referring to drawings, sketches, photographs, etc., in sufficient detail to enable one knowledgeable in the invention's field of technology to understand construction and operation of the invention. Drawings, etc., should show only those features necessary for an understanding of the invention. Describe how/why your invention overcomes the disadvantages noted in 2. (ii) above.**

The idea is to take internal signals, buses, etc. inside a device (or I/O) and send this information out of the device (transmit mode) or push data into the device (receive mode). A block diagram using a wireless system as an example is shown below.

*** Provide the information requested in this box on each page of the submission, as well as drawings, sketches, photographs, etc. ***

**Submitter(s) signature(s) and date:**

_____ _____
**date**

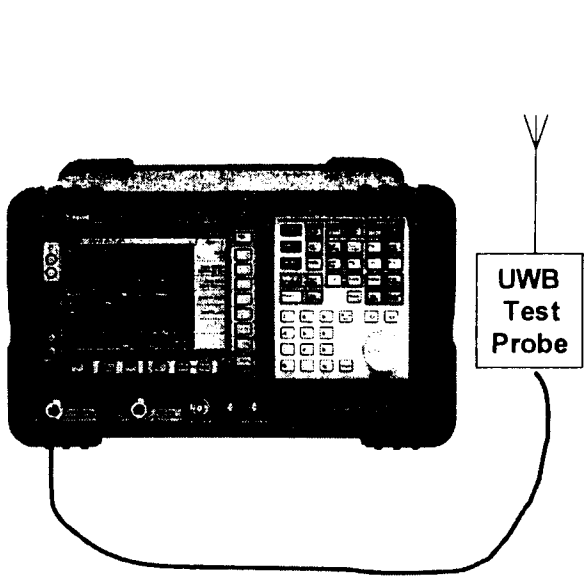
_____ _____
**date**

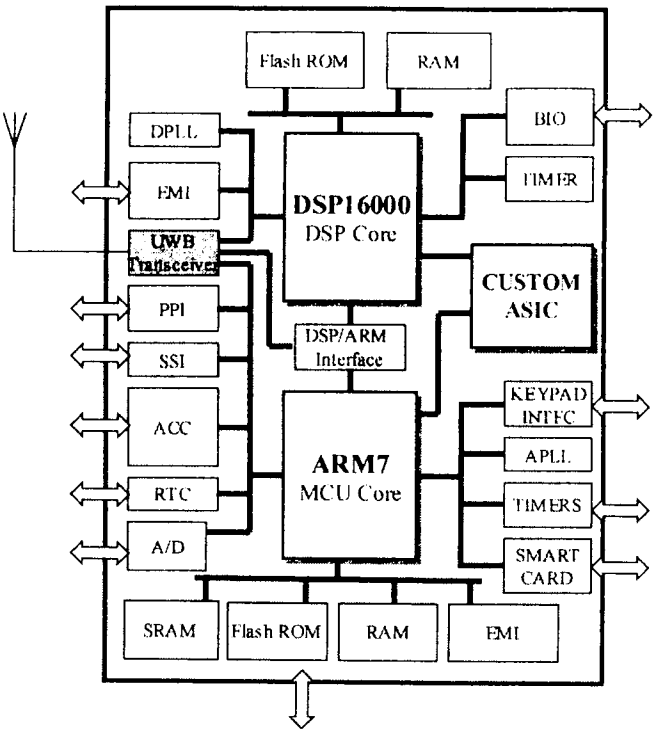
_____

**This invention submission has been read and understood by the following two witnesses:**

_____ _____
**date**

_____ _____
**date**




One embodiment of this idea could be a "Wireless JTAG" port that makes use of simple ultra-wideband (UWB) wireless techniques to transfer large amounts of data without the need for numerous I/O pins ( as well as using less power and die area), similar to the way JTAG provides access to internal signals via a 4 pin interface. Under a best case scenario, this idea could be the foundation for a "Wireless JTAG" testing standard.

**5. Advantages of your invention:**

The main advantage of this idea is the ability to easily monitor dozens of signals inside a high a speed SOC device. Other advantages include the ability to more closely align testing capability with simulation for faster silicon debugging, the ability to inject large quantities of data into the system for testing and validation, and the overall ease of use compared to existing methods.

Potential areas of application include:

- Simplified test and debug setup as described above
- Processor debugger (e.g., CPU, DSP, network processor, microcontroller, multimedia, etc.)
- Wireless system analysis (e.g., analyze radio I/Q data, real time channel conditions, equalizer state, etc.)
- Wafer and package ATE testing including multi-site testing
- Simplify FMA by providing real time access to large numbers of internal signals
- Replace electrical buses for chip to chip communication for normal operation (M. Richman idea?)

*** Provide the information requested in this box on each page of the submission, as well as drawings, sketches, photographs, etc. ***

**Submitter(s) signature(s) and date:**

_____ _____
**date**

_____ _____
**date**

_____ _____

**This invention submission has been read and understood by the following two witnesses:**

_____ _____
**date**

_____ _____
**date**

**6. Explain how use of your invention would be detected:**

Detection should be fairly simple since operational details would need to be included in datasheets and user manuals. Support for test equipment with this capability would also indicate use of the invention.

*** Provide the information requested in this box on each page of the submission, as well as drawings, sketches, photographs, etc. ***

**Submitter(s) signature(s) and date:**

_____ _____
**date**

_____ _____
**date**

_____ _____

**This invention submission has been read and understood by the following two witnesses:**

_____ _____
**date**

_____ _____
**date**

ATTORNEY-CLIENT PRIVILEGED DOCUMENT

1150-1160

Exhibit 2

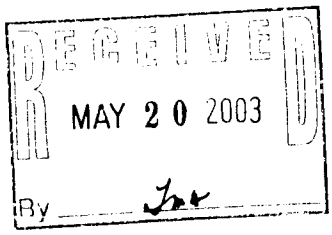
agere systems

**Kyshon J. Rivers**
Outside Counsel Coordinator
Intellectual Property Law

~~P.O. Box 614~~
Berkeley Heights, NJ 07922-0614

Tel: ~~908-582-2834~~ 610-712-8514
Fax: ~~908-582-6766~~ 610-712-8544
krivers@agere.com

May 19, 2003




Joseph Ryan, Esq.
Ryan, Mason & Lewis, LLP
90 Forest Avenue
Locust Valley, NY 11560

Re: **IDS No.:** 124672 **(CLASS III)**

| **Managing Attorney** | **Telephone No.** | **Fax No.** |
|---|---|---|
| Mark Kurisko | (610) 712-3754 | (610) 712-3774 |
| **Secretary** | **Telephone No.** | |
| Rachel Panczyszin | (610) 712-3757 | |

Dear Mr. Ryan:

The above-referenced patent submission enclosed with this letter should be filed by **August 19, 2003**, in accordance with Agere's general instructions for Outside Counsel, previously furnished to you. If, for any reason, you cannot meet the filing date requested, you MUST notify the Managing Attorney (MA) and me, VIA FACSIMILE, as soon as possible.

After the final claims have been drafted and you are therefore in a position to identify the inventors, please send "Request for Case Name/Number" (ATTACHMENT G), VIA FACSIMILE, to me at (610) 712-8544.

Unless the MA has otherwise agreed, our instructions are that a copy of the proposed application is to be sent to the MA prior to execution of the Declaration and Assignment; likewise, all other substantive papers such as amendments, appeal briefs and the like are to be sent to the MA prior to filing. Please note, however, that the MA may not be in a position to review the application or other papers prior to filing, or may choose to conduct only a quality control review either now or at a later time. Accordingly, the ultimate responsibility for the timely filing as well as the quality and contents of the papers of this application and any resulting patent rests with you. **If you do not receive specific instructions from the MA within eight (8) business days from the date that the application or any subsequent papers were submitted to the MA, you are authorized and directed to transmit same directly to the USPTO.**

This application will not be foreign filed.

If, during the prosecution of an application, you believe that a CPA/CIP, Divisional, Appeal, etc. should be filed, your advice should be presented to the Managing Attorney for concurrence, prior to commencement of any work.

Very truly yours,

**Kyshon J. Rivers**

Enc.

CI-III/IV

july 2003

Exhibit 3

14 Monday

Sawyer 19

4 Inna

15 Tuesday

Borders
Bobrea
2 Sharokh

4 JSH

16 Wednesday

9 Haircut.

10 Barq. Rigge 1150-1184
1114 ave

1150 - 1160

Inna 1 Roey Krasinski 1100-166
323-9687

3-4 Bshanna
Bunco ~~4 Jillyanna~~

17 Thursday

MTK
CDS
Coffee

Pike 15
email Falvey et al
Call CJP re: Appeal of Risk
↓
Eat Desk

**Kevin Mason**

**From:** Rigge, Lawrence A (Lawrence) [rigge@agere.com]
**Sent:** Thursday, August 21, 2003 5:27 PM
**To:** Kevin M. Mason; Rigge, Lawrence A (Lawrence)
**Subject:** RE: UWB Test File

Kevin,

Thanks. My computer crashed (virus) and I'm finally getting to my email. I think about some examples over the weekend.

Larry R.

***Lawrence Rigge***
**Manager, Technology Assessment & Roadmapping**
**Wireless CTO Organization**
**Agere Systems**
Phone: (610) 712-3327
Email: rigge@agere.com

-----Original Message-----
**From:** Kevin M. Mason [mailto:kmm@rml-law.com]
**Sent:** Monday, August 18, 2003 11:43 AM
**To:** Rigge, Lawrence A (Lawrence)
**Subject:** Re: UWB Test File

Hi Larry:
I attach an initial draft of your patent application. I look forward to hearing your comments. It would be worthwhile to provide a discussion of some exemplary tests and the corresponding signals that are communicated back and forth.
Regards
Kevin

Rigge, Lawrence A (Lawrence) wrote:

> Kevin,
>
> I'll be out on vacation the week of 8/4, back the week of 8/11.
>
> Larry R.
>
> Lawrence Rigge
> Manager, Technology Assessment & Roadmapping
> Wireless CTO Organization
> Agere Systems
> Phone: (610) 712-3327
> Email: rigge@agere.com
>
> -----Original Message-----
> From: Kevin M. Mason [mailto:kmm@rml-law.com]
> Sent: Thursday, July 24, 2003 5:47 PM
> To: Rigge, Lawrence A (Lawrence)
> Subject: Re: UWB Test File
>
> Hi Lawrence:
> Thanks for the materials. I will be out on vacation next week and
> probably will not be able to get a draft out before I leave. Are you
> going to be available during the week of 8/4 to work on this patent
> application?
> Thanks,
> Kevin
>
> Rigge, Lawrence A (Lawrence) wrote:
>
> > Kevin,
> >
> > Attached is the MS-Word file for my original submission. Thanks for your
> > help.
> >
> > LAR
> > Lawrence Rigge
> > Manager, Technology Assessment & Roadmapping
> > Wireless CTO Organization
> > Agere Systems
> > Phone: (610) 712-3327
> > Email: rigge@agere.com
> >
> > <<LAR Patent Idea 03312003.doc>>

--

Kevin M. Mason
Ryan, Mason & Lewis, LLP
1300 Post Road, Suite 205
Fairfield, CT 06430
(203) 255-6558 (voice)
(203) 255-6570 (fax)

CONFIDENTIALITY NOTICE

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**Kevin Mason**

**From:** Rigge, Lawrence A (Lawrence) [rigge@agere.com]
**Sent:** Tuesday, August 26, 2003 11:16 AM
**To:** Kevin M. Mason; Rigge, Lawrence A (Lawrence)
**Subject:** RE: UWB Test File

Kevin,

Here are my editing suggestions and additions. I'm open most of the week except when my boss stops by (he's visiting from the Netherlands) so you can either schedule a time or "cold call" when it's convenient for you.

Larry R.
PS Figure 2 did not show up properly for me - I assumed it was based on the updated UWB slide I sent earlier.

***Lawrence Rigge***
**Manager, Technology Assessment & Roadmapping**
**Wireless CTO Organization**
**Agere Systems**
Phone: (610) 712-3327
Email: rigge@agere.com

-----Original Message-----
**From:** Kevin M. Mason [mailto:kmm@rml-law.com]
**Sent:** Tuesday, August 26, 2003 9:27 AM
**To:** Rigge, Lawrence A (Lawrence)
**Subject:** Re: UWB Test File

Hi Larry:
When do you think you will be ready to discuss the patent application? I am in my own office today and Friday, but will be working in our Long Island office on Wednesday and Thursday. The best way to reach me after today will be by email or on my cell phone at 203-258-5638. If possible, I'd like to send the application to the Managing Attorney for his review in the next day or two (but that requires your prior approval of the application).
Regards,
Kevin

Rigge, Lawrence A (Lawrence) wrote:

Kevin,

Thanks. My computer crashed (virus) and I'm finally getting to my email. I think about some examples over the weekend.

Larry R.

***Lawrence Rigge***
**Manager, Technology Assessment & Roadmapping**
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**Agere Systems**
Phone: (610) 712-3327
Email: rigge@agere.com

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**Sent:** Monday, August 18, 2003 11:43 AM
**To:** Rigge, Lawrence A (Lawrence)
**Subject:** Re: UWB Test File

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Larry R.

Lawrence Rigge
Manager, Technology Assessment & Roadmapping
Wireless CTO Organization
Agere Systems
Phone: (610) 712-3327
Email: [illegible]

-----Original Message-----
From: Kevin M. Mason [mailto:[illegible]]
Sent: Thursday, July 24, 2003 5:47 PM
To: Rigge, Lawrence A (Lawrence)
Subject: Re: UWB Test File

Hi Lawrence:

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Kevin

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> Attached is the MS-Word file for my original submission. Thanks for your help.
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> LAR
> Lawrence Rigge
> Manager, Technology Assessment & Roadmapping
> Wireless CTO Organization
> Agere Systems
> Phone: (610) 712-3327
> Email: rigge@agere.com
>
> <<LAR Patent Idea 03312003.doc>>

--
Kevin M. Mason
Ryan, Mason & Lewis, LLP
1300 Post Road, Suite 205
Fairfield, CT 06430
(203) 255-6558 (voice)
(203) 255-6570 (fax)

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Exhibit 6

## Kevin Mason

**From:** Rigge, Lawrence A (Lawrence) [rigge@agere.com]
**Sent:** Thursday, September 25, 2003 11:42 AM
**To:** Kevin M. Mason; Rigge, Lawrence A (Lawrence)
**Subject:** RE: Patent Status

Kevin,

I signed all the documents - you should be receiving a FAX soon and the signed documents in the mail.

Thanks,

Larry R.

Lawrence Rigge
Manager, Technology Assessment & Roadmapping Wireless CTO Organization Agere Systems
Phone: (610) 712-3327
Email: rigge@agere.com

-----Original Message-----
From: Kevin M. Mason [mailto:kmm@rml-law.com]
Sent: Thursday, September 25, 2003 8:43 AM
To: Rigge, Lawrence A (Lawrence)
Subject: Re: Patent Status

Thanks! Please fax the executed documents when they are ready (and mail us the originals), and we can file the application today.
Have a good day,
Kevin

Rigge, Lawrence A (Lawrence) wrote:

>Kevin,
>
>The Email arrived Tuesday night. I should have everything signed and
>notarized later this morning.
>
>Larry R.
>
>
>Lawrence Rigge
>Manager, Technology Assessment & Roadmapping Wireless CTO Organization
>Agere Systems
>Phone: (610) 712-3327
>Email: rigge@agere.com
>
>
>-----Original Message-----
>From: Kevin M. Mason [mailto:kmm@rml-law.com]
>Sent: Thursday, September 25, 2003 8:12 AM
>To: Rigge, Lawrence A (Lawrence)
>Subject: Patent Status
>
>
>Hi Larry:
>I wanted to confirm that you received my email earlier this week
>containing the final draft with paperwork for you to execute. We were
>having trouble with our email server. Please let me know. We plan to
>file this application this week.

>Regards,
>Kevin
>
>
>

--
Kevin M. Mason
Ryan, Mason & Lewis, LLP
1300 Post Road, Suite 205
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(203) 255-6570 (fax)

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